the bodies cluster around the nucleus, noting that "the resolving power of the light microscope would not separate them and as a consequence they would appear as a complex" (p. 72). (Recall from Chapter 4, though, that five years later Claude would join with Palade to argue that the Golgi was indeed an artifact.)

Porter (1955–6, p. 175) characterized the goal in making these early micrographs as "to see what there might be in the optically empty parts of protoplasm."[19] Over the years several authors had proposed the existence of a cytoskeleton that was responsible for maintaining the structure of the cell (Needham, 1942; see also Bonner, 1952; Peters, 1930; Picken, 1940). With respect to this claim, the micrographs produced novel and controversial results. In the *Annual Report* Porter and Claude referred to the ground substance as *spongioplasm* and reported that in the micrographs it appeared to be comprised of particulate elements 30 to 150 m μ in diameter. In the published paper they commented on the status of these structures:

> It is not known whether the particulate elements just mentioned pre-exist in the living protoplasm, or whether they are artifacts arising from the cell body or the cell wall, as a result of fixation or drying. In this connection, however, it is of interest to recall that experiments in this laboratory have shown that the chromophilic ground substance is sedimentable and, therefore, probably particulate in nature. Touching on this problem also is the fact that small particles, or microsomes, estimated to average about 70 m μ in diameter have been previously isolated from extracts of normal chick embryos and Chicken Tumor I. (Porter et al., 1945, p. 238)

The authors then proceeded to a second observation – a lace-like reticulum running through the thinner parts of the cell.[20] They reported that "vesicle-like

[19] Porter (Interview, 1987, University of Maryland, Baltimore County) recalled that he had no particular hypothesis in mind in generating the first micrographs, although he was convinced from dark-field light microscopy that there had to be more structure than light microscopy could reveal. Rather, the availability of tissue-cultured cells provided "an excuse" to see what the electron microscope might reveal. The experience of seeing the first micrographs apparently created a "flash-bulb memory" for Porter. He related to me with obvious excitement, "I remember the night so distinctly I could play it back. It was in the war. New York City was blacked out. It was cold and raining and black, was it black. And we were trying to find the entrance to the building on 48th Street, West Side. We got this thing, I think there was only one cell on the grid, but it was between the bars and we took picture after picture of it, we must have taken 30 or 40 micrographs of it so that we could piece together the whole thing. And I was fascinated, I was really fascinated. I don't think I slept at all that night. We didn't leave there until 3:00 A.M."

[20] Porter (Interview, 1987, University of Maryland, Baltimore County) related that initially they had "no idea what the lace-like stuff was inside the cytoplasm." Of particular interest was the fact that it fragmented in tissue-cultured cells, which suggested that while it was incapable